

Abstract of the Disclosure

A polymer electrolyte fuel cell stack includes cells having separators that can be supplied fuel or oxidant either in series or in parallel is disclosed. At high power loads the cells are operated in parallel, and at low power load the cells are operated in series.

Advantageously, operating the cells in series at low power loading allows high gas flows thereby minimizing water condensation and improving the stability and performance of the cell stack during low load operation. Individual cells include a polymer electrolyte membrane sandwiched by a pair of electrodes, which in turn are sandwiched by a pair of electrically conductive separators. The separators have gas channels on their surfaces to supply oxidant gas and fuel gas to the cathode and anode, respectively, that can be manipulated to operate in parallel or series.